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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/738,543
Filing Date: December 17, 2003
Appellant(s): GOTTSCHALK-GAUDIG ET AL.

William G. Conger
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on November 12, 2010 appealing from the Office action mailed on May 17, 2010.

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(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: Claims 15-19 and 30-37.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

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WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

“Claim 15-17, 19, and 30-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.”

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

JP04298538A	ENDO ET AL	10-1992
5,623,028	FITZGERALD ET AL	4-1997
5,573,189	WARD ET AL	11-1996

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 15-19 and 30-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al (JP 04298538 A) in view of Fitzgerald et al (US 5623028) and Ward et al (US 5573189).

Endo et al discloses silica particles for the use as filler in a polyester film composition (See Transl. Example 1). Endo teaches that blocking 30-70% of silanol

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groups on the surface of silica filler by silane coupling agent such as vinyltriethoxysilane (silane I as claimed in claims 15 and 17) (See Abstract) provides excellent dispersibility in a polyester film composition (See Transl. Example 1); the silica particles having before treatment the number of silanol groups on the surface in the range of 1-30 groups/nm², preferably 5-15 groups/nm² (See Transl. P15), average particle size of 0.1-5 microns (See Transl. P16) and BET surface of 100-700 m²/g (See Transl. P12). Thus, 70-30% of the total 1-30/nm² silanol groups (i.e. 0.3-21 SiOH/nm²) would remain unblocked, and thus, silica is partly hydrophobic silica.

In short, Endo teaches treating starting silica particles having 1-30 SiOH/nm² with vinyltriethoxysilane (silane I as claimed in claims 15 and 17) to block surface silanol groups with a degree of coverage $30\% \leq \tau \leq 70\%$ that overlaps claimed degree of coverage of $1\% < \tau < 50\%$ thus resulting in blocked silica having $1 \times (0.3-0.7) - 30 \times (0.3-0.7)$ SiOH/nm², i.e. 0.3-21 SiOH/nm² that overlaps claimed range of 0.9-1.7 SiOH/nm². It is well settled that overlapping ranges are prima facie evidence of obviousness.

Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Endo's ranges that corresponds to the claimed ranges. Thus, silica of Endo would include silica having a carbon content within claimed 0% - 2.0% by weight since silica would be covered with claimed silane at a claimed degree of coverage and resulting in silica particles having a density of surface silanol groups within claimed range of 0.9 and 1.7 SiOH/nm².

As to claimed methanol number and claimed a contact angle θ , since the degree of hydrophilicity/hydrophobicity of the surface, i.e. contact angle θ in air for water and methanol number, is determined by the number of free SiOH groups on the surface, silica

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of Endo would include silica meeting claimed methanol number of less than 30 or less than 20 and claimed contact angle θ in air for water of less than 180° , as having surface silanol groups within claimed amount of 0.9 and 1.7 SiOH/nm^2 .

As to claimed amount of silane and claimed carbon content, since in the silica particles of Endo et al, 30%-50% of SiOH groups would be covered with claimed vinyltriethoxysilane such that claimed amount $0.9\text{-}1.7 \text{ SiOH/nm}^2$ would remain unblocked, the vinyltriethoxysilane would be used in the same amount as in claimed process, i.e. within 0.015 mmol/g - 0.15 mmol/g per 100 m^2 /of silica BET surface, and, thus, the carbon content would be within claimed range of $0\text{-}2.0 \text{ wt } \%$.

As to claimed fumed silica prepared under anhydrous conditions, Endo teaches that as a method for the manufacture of silica particles, the so called wet process method, that is, the method using a medium with water as the major component can be utilized. For example, sodium silicate and a calcium salt of a calcium hydroxide or the like are reacted. First of all, after the formation of calcium silicate, it is decomposed with a mineral acid, carbon dioxide gas or the like for synthesis of particles with silica as the major constituting component.” (See P11). In other words, Endo does not limit its teaching to particular methods of preparing starting silica particles. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used any silica particles as starting particles in Endo with the expectation of providing the desired excellent dispersibility in a polyester film composition as long as they meet Endo’s requirements for particle size ($0.1\text{-}5 \text{ microns}$), BET ($100\text{-}700 \text{ m}^2/\text{g}$), and surface silanol group ($1\text{-}30/\text{nm}^2$). However, Endo et al fails to teach that silica

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particles meeting the above requirements include fumed silica prepared under anhydrous conditions.

Fitzgerald et al teaches that various forms of fumed silica particles having a BET surface area of 200 m²/g and a maximum surface silanol density (See column 5, lines 58-61) of e.g. 4.5 OH groups/nm wherein the surface silanol density is controlled (See column 4, lines 38-45) by treating with silane to reduce the concentration of surface silanol groups, may be used as reinforcing filler in resin compositions (See column 11, lines 52-55) to impart desired properties to cured compositions (See column 1, lines 57-68). Note that “nm” in Fitzgerald et al means square nm (See column 15, line 30). Note that by definition fumed silica is prepared under anhydrous conditions. Note also that it is well known in the art that fumed silica may have less than 4.5 OH groups/nm², as evidenced by current Appellants’ Remarks (See page 9, footnote 2).

Ward et al is applied here as evidence to show that a typical commercially available fumed silica filler has a surface area of 200 m²/g (See column 6, lines 3-4) and particle size of 0.20-0.35 microns (See column 2, lines 29-31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used typical commercially available raw fumed silica having particle size of 0.20-0.35 microns as starting silica in Endo et al for treating with silane coupling agent with the expectation of producing silica particles having excellent dispersibility in a polyester film composition since Endo et al does not limit its teaching to particular silica, and commercially available raw fumed silica has particle size, a surface area and a surface silanol density within ranges required in starting silica of Endo et al.

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One of ordinary skill in the art would have reasonable expectation of success in using fumed silica since Endo et al does not limit its teaching to particular silica.

Note also that according to the Appellants' specification it is irrelevant whether starting silica is fumed silica or wet process silica (See Appellants Spec., page 3, lines 4-9).

As to claims 16, 18, 19, and 33, limitations of the claims are not addressed as being optional.

As to claim 37, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See Ex parte Obiaya, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

(10) Response to Argument

B. Rejection of the Claims Under 35 U.S.C. § 103(a)

Endo in view of Fitzgerald and Ward.

Appellants assert that Endo is directed to preparing polyester films with improved running characteristics while maintaining transparency. Endo sought to improve running characteristics by the use of a special solution-processed silica ("colloidal silica") which has silane coupling agents bearing reactive organic functional groups grafted to the surface of the silica. As is well known, colloidal silica consists of spherical particles, and ordinarily has particle sizes in the low nm range. Such colloidal silicas are widely used as the abrasive in chemical mechanical polishing of silicon wafers, for example. However, the particles of Endo are required to be rather unconventionally larger, with a minimum particle size of 0.1 μm (100 nm), and a maximum particle size of 5 μm (5000nm) ([0008]), more preferably 0.5 μm to 2 μm (500 nm - 2 μm (2000nm)) [0016]. Endo

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indicates that the particles he uses are unlike other particles, which can be destroyed by stretching during film orientation. [0005]. This is not surprising, since colloidal silica particles are spherical and uniform, as is well known. A photomicrograph of colloidal silica is shown below. The uniformity and high sphericity are notable. Reference may also be made to the "colloidal silica bible", R.K. Her, The Colloid Chemistry of Silica and Silicates, Cornell University Press, Ithaca, New York, 1955. This reference is now some five decades old, and its teachings are so well known that judicial notice may be taken thereof. Spherical particles have no anisotropy. Therefore, they react to stress in the same manner, regardless of the direction from which the stress is applied. This is one reason that the specific particles of Endo are not destroyed during stretching. Non-spherical particles, especially elongate particles, can easily be destroyed in stretching. Spherical particles are also non-orientable: They cannot be oriented during stretching of the film due to the fact that they are spherical. However, Endo indicates that the use of spherical, colloidal silica particles of large size, alone, is not sufficient.

The Examiner respectfully disagrees with this argument. First of all, in contrast to Appellants' assertion, Endo indicates nowhere spherical, colloidal silica particles. Also Endo teaches nowhere that starting silica is a special solution-processed silica ("colloidal silica") or discusses anywhere the shape of the silica particles or how the shape of the particles affect running characteristics of polyester films while maintaining transparency. Instead, Endo teaches that polyester films with improved running characteristics while maintaining transparency may be prepared using silica particles having average particle size of 0.1-5 microns and containing 1-30/nm² of silanol groups, where 30-70% of the total silanol groups are blocked by a silane coupling agent: the size within 0.1-5 microns is important to form protrusions that improve running characteristics of the polyester (See P4, 5 and 29); the amount of silanol groups is important because if the blocking ratio is less than 30% or greater than 70%, the dispersibility of silica particles in polyester will be

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poor (See P14). Also if the blocking ratio is less than 30%, the silanol groups interact with polymerization catalyst which decreases polymerization rate; and the silica particles lack affinity with polyester such as spaces are formed in the circumference of the particles during stretching, which diminish transparency of the polyester film (See P5).

Thus, Endo teaches that the only important characteristics of silica particles are particle size and the amount of silanol groups. Further, in contrast to Appellants' assertion, Endo discusses nowhere the shape of the silica particles or how the shape of the particles affects running characteristics of polyester films while maintaining transparency.

Second, in contrast to Appellants' assertion, Endo neither limits the shape of starting silica particles nor methods of manufacturing starting silica particles. Endo states in a single claim and in the Summary of the Invention (See P8) that silica particles for the use in the polyester film are obtained from silica particles having average particle size of 0.1-5 microns and containing 1-30/nm² of silanol groups, where 30-70% of the total silanol groups are blocked by a silane coupling agent without mentioning methods of manufacturing of starting silica particles. There are only two paragraphs (P11 and 12) where Endo discusses (possible) methods of manufacturing starting silica particles. In paragraph 11, Endo teaches: "As a method for the manufacture of such particles, the so called wet process method, that is, the method using a medium with water as the major component can be utilized. For example, sodium silicate and a calcium salt of a calcium hydroxide or the like are reacted. First of all, after the formation of calcium silicate, it is decomposed with a mineral acid, carbon dioxide gas or the like for synthesis of particles with silica as the major constituting component." In paragraph 12, Endo teaches: "There are silanol 1-30 groups/nm² or so and remarkably more by the gas-phase method. If such

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particles are added in the polyester manufacturing process and the polymerization reaction is carried out, polymerization reaction will be delayed.” Clearly, Endo’s teaching “wet process method can be utilized” could hardly be interpreted by one of ordinary skill in the art as a guidance to limit the methods of manufacturing starting silica particles to the wet processes. Thus, reading Endo as a whole, one of ordinary skill in the art would easily recognize that the starting silica particles should meet basically two requirements: particle size within 0.1-5 microns and the amount of silanol groups within 1-30 groups /nm². Since Endo does not limit methods of manufacturing of starting silica particles, one of ordinary skill in the art would reasonably assume that any methods of making starting silica particles would be suitable as long as the starting silica particles meet the above particle size and silanol group requirements.

Third, by definition, colloidal particles have particle size of less than 1 micron. Therefore, even it is conceded that wet process silica particles of Endo are colloidal particles, they are not separate colloidal particles but aggregates of the colloidal particles since they have particle size up to 5 microns. As is well known in the art, special methods would be required to make aggregated particles in the spherical shape. Since Endo does not describe any special methods for making silica particles of up to 5 microns spherical, it should be assumed that the shape of the silica particles are irrelevant in Endo.

Moreover, the Appellants’ specification discloses: " The metal oxide base product (starting product) used for the silylation preferably comprises metal oxides such as silica, either precipitated (i.e. wet method – added by the Examiner) or fumed, titanium dioxide, aluminum dioxide, zirconium dioxide and their mixed oxides, which may have been prepared by wet methods, plasma methods or flame operation; preference is given to

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silicas (silicon dioxide), more preferably fumed silica, most preferably a silica prepared under anhydrous conditions.” (See page 3, lines 4-9). Thus, according to Appellants’ own specification, it is irrelevant whether a wet process silica or fumed silica is utilized.

Thus, it is appeared that claim 15 was amended to incorporate limitation "fumed silica particles prepared under unhydrous conditions" on March 23, 2003 merely to overcome Endo.

Appellants submit that at the end of P[0012], Endo indicates that silica produced by "the gas phase method", i.e. fumed silica, is not acceptable, since the polymerization will be delayed, a problem discussed with other fillers in P[[0006]. The disclosure of Endo is not well understood, and has numerous inconsistencies which are at sharp contrast to what is well known to those skilled in the art. For example, Endo discloses that his colloidal silica particles have a surface silanol content of 1-30/nm² (1-30 SiOH per square nanometer). However, colloidal silica is prepared in an aqueous environment and conventionally has a surface silanol content of 4-5 SiOH/nm². See, e.g. A.P. LeGrand, The Surface Properties of Silicas, John Wiley & Sons, Chichester, 1998. The fumed silicas exemplified by Endo have surface silanol contents above this conventional range, 7.0 and 8.0 SiOH/nm². This corresponds to the maximum silanol content as calculated and measured by numerous researchers, as reported in Iler, Op. Cit., pages 241-247, where the maximum, assuming 100% surface coverage by silanol groups is 8. However, colloidal silicas having SiOH group contents appreciably lower than 4 are unknown, and Endo does not disclose how any colloidal silicas having this low silanol 8 content could be prepared. Fumed silica, as is well known, generally has about 2.5 to 3 SiOH/nm² as prepared. These values may range higher if the silica is not prepared under anhydrous conditions or is allowed to adsorb water following preparation.

The Examiner respectfully disagrees with this argument. The Examiner agrees that the meaning of the end of P[0012] is difficult to understand. However, the machine

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translation of Endo reads as “There are many the silanol groups remarkably at a 1-30 piece $[\text{nm}]^2$ grade compared with it of a gaseous phase method”, and thus, it seems that the translator inadvertently omitted the word “compared” while translating the end of P[0012]. In other words, it appears that Endo teaches in the end of P[0012] that silica made by the gaseous phase method has less amount of silanol groups than wet silica.

However, even with the omitted word, it is clear that Endo does not limit its teaching to particular methods of preparing silica particles.

Moreover, the Appellants’ statements: “colloidal silica that is prepared in an aqueous environment and conventionally has a surface silanol content of 4-5 SiOH/nm^2 ; and fumed silica, as is well known, generally has about 2.5 to 3 SiOH/nm^2 as prepared” only confirm the Examiner’s position that silica of Endo is any type of silica having 1-30 SiOH/nm^2 not just silica prepared by conventional wet or gas phase methods.

Appellants submit that Endo indicates [0015] that if the silanol content of the starting silica is below 1 SiOH/nm^2 , the particles have no dispersibility in water or alcohols, and yet it has been shown by applicants that silica having such an SiOH content is at least partly dispersible in water, and fully dispersible in methanol, for example. Endo also discloses that if the silanol content is greater than 30 SiOH/nm^2 , dispersibility in water and alcohol is poor, and yet it is well known that the higher the number of surface silanol groups, the higher the polarity, and the higher the dispersibility. These inconsistencies of Endo would lead one skilled in the art to question the technical validity of the entire Endo disclosure.

The Examiner respectfully disagrees with this argument because despite the fact that the portion of the P15 contradicts the other portion of the P15, Endo’s major teaching

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of treating 30-70% of silanol groups on silica particles with a silane is clear enough to follow in order to achieve improved dispersibility in polyester.

Appellants submit that Endo does not disclose the use of fumed silica treated with a coupling agent, and the office has supplied Fitzgerald to allegedly supply this deficiency. The Office cites Fitzgerald for disclosing a "raw" (untreated) fumed silica having a BET surface area of $200 \text{ m}^2/\text{g}$ and a surface silanol content of $4.5 \text{ SiOH}/\text{nm}^2$, which may be treated with silane to reduce the surface silanol content, to use as a filler in "resin compositions" (Office Action of May 17, 2010, page 4). Applicants are not sure where the term "resin compositions" comes from, as Fitzgerald is not directed to silicone resins, a term of art quite distinct from the use of the term "resin" in other fields, but is directed to silicone rubber formulations. Ward is cited for the proposition that $200 \text{ m}^2/\text{g}$ surface area commercial silica has a particle size of 0.20-0.35 microns. This is partially correct. Ward is directed to the use of fumed silica of reduced particle size in injection moldable polymers. The starting silica has a surface area of from 50 to $600 \text{ m}^2/\text{g}$ and an initial aggregate size (not particle size) of 0.10 to $0.25 \text{ }\mu\text{m}$ (col. 2, line 56). However, Ward teaches that such silica is unsuitable for injection molding of polymers, and teaches that the aggregates should be broken down under high shear to smaller particle sizes. No ultimate aggregate sizes are given, but it is clear that Ward teaches away from using particles of 0.1 μm or larger, since the minimum size of the starting aggregates is 0.1 μm , and Ward teaches high shear size reduction of these to smaller sizes. The Office states: Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used typical commercially available raw fumed silica having particle size of 0.20-0.35 microns as raw silica in Endo et al for treating with silane coupling agent with the expectation of producing silica having excellent dispersibility in a polyester film composition since Endo et al does not limit its teaching to particular raw silica, and commercially available raw fumed silica has particle size, a surface area and a surface silanol density within ranges required in raw silica of Endo et al. However, Endo is very specific about his silica, which is a colloidal silica of relatively large particle size, and indicates that prior attempts to use other fillers, including other

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silicas, even silicas compatible with the polyester matrix, are deficient. Endo thus teaches away from using other silicas, e.g., silicas other than large size, colloidal silica of spherical morphology. Teaching away is strong evidence of non-obviousness, *W.L. Gore v. Garlock*, 721 F.2d 1540 (Fed Cir 1983).

The Examiner respectfully disagrees with this argument. First of all, the Examiner strongly disagrees with Appellants' unfounded statement: "Endo is very specific about his silica, which is a colloidal silica of relatively large particle size, and indicates that prior attempts to use other fillers, including other silicas, even silicas compatible with the polyester matrix, are deficient. Endo thus teaches away from using other silicas, e.g., silicas other than large size, colloidal silica of spherical morphology." As discussed above, Endo teaches nowhere that only colloidal silica made by wet process should be used.

Second, Endo does not teach that silica should be made by specific methods. In fact, Endo describes neither in the disclosure nor in the Examples any specific method for preparing suitable silica. In P11, Endo discloses some possible methods without describing any details. Therefore, it is clear that any silica that meets two major requirements: particle size within the range of 0.1-5 microns and silanol groups in the range of 1-30/nm² would be suitable for treating with silane.

Fitzgerald and Ward were applied by the Examiner only as **evidence** that conventionally made fumed silica does meet the above two major requirements of Endo. Therefore, it is irrelevant whether or not Fitzgerald and Ward show that their silica may be used in polyester.

Thus, in contrast to Appellants' argument, the Office statement: "Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was

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made to have used typical commercially available raw fumed silica having particle size of 0.20-0.35 microns as raw silica in Endo et al for treating with silane coupling agent with the expectation of producing silica having excellent dispersibility in a polyester film composition since Endo et al does not limit its teaching to particular raw silica, and commercially available raw fumed silica has particle size, a surface area and a surface silanol density within ranges required in raw silica of Endo et al.” is correct.

Appellants assert that the subject invention is not directed to the problem addressed by Endo, improving the running characteristics of polyester films, but is directed to the problem of providing aqueous dispersions which are stable without the use of conventional emulsifiers and surfactants. This was surprisingly and unexpectedly achieved by the use of partly water-wettable fumed silicas, a problem totally remote from that of Endo.

In response to Appellants's argument that the subject invention is not directed to the problem addressed by Endo, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Appellants submit that there is no prima facie case of obviousness here. It is well settled that teachings of a reference can only be modified when there is some objective teaching or suggestion in the references themselves or knowledge generally available to one of ordinary skill in the art as to the desirability or incentive of such a modification. See, e.g. MPEP § 2143. If the prior art provides no reason for one of ordinary skill in the art to modify the prior art as claimed, the modification would not have been obvious.

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The Examiner respectfully disagrees with this argument. As discussed above, Endo does not teach that silica should be made by specific methods. In fact, Endo describes neither in the disclosure nor in the Examples any specific method for preparing suitable silica. In P11, Endo discloses some possible methods without describing any details. Therefore, it is clear that any silica that meets two major requirements: particle size within the range of 0.1-5 microns and silanol groups in the range of 1-30/nm² would be suitable for treating with silane. Fitzgerald and Ward were applied by the Examiner only as **evidence** that conventionally made fumed silica does meet the above two major requirements of Endo. Therefore, it is irrelevant whether or not Fitzgerald and Ward show that their silica may be used in polyester.

Thus, in contrast to Appellants' argument, the Office statement: "Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used typical commercially available raw fumed silica having particle size of 0.20-0.35 microns as raw silica in Endo et al for treating with silane coupling agent with the expectation of producing silica having excellent dispersibility in a polyester film composition since Endo et al does not limit its teaching to particular raw silica, and commercially available raw fumed silica has particle size, a surface area and a surface silanol density within ranges required in raw silica of Endo et al." is correct. Thus, three basic criteria of the prima facie case of obviousness have been met: (i) there is suggestion or motivation in the **references themselves** to combine reference teachings; (ii) there is a reasonable expectation of success; (iii) finally, the prior art references when combined teach or suggest all the claim limitations.

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Appellants argue that the combination of Endo, Fitzgerald, and Ward, even were this combination proper, does not disclose, teach, or suggest claimed five physical property limitations of silica particles:

- 1) a contact angle θ in air for water of less than 180° ;
- 2) a degree of coverage 1: of 1% - 50%;
- 3) a density of surface silanol groups between 0.9 and 1.7 SiOH/nm²;
- 4) a carbon content of greater than 0% and up to 2.0% by weight; and
- 5) a methanol number of less than 30.

In addition, the claim requires the silica to have been silylated with silanes I), II), or a mixture thereof. None of the references even mentions contact angle, carbon content, or methanol number. Endo mentions degree of coverage, but for colloidal silica, not for fumed silica. Fitzgerald mentions density of surface silanol groups in silylated fumed silica, but the lowest value reported is 2.39. Fitzgerald does not disclose any value even close to Appellants maximum value of 1.7, nor does he enable the preparation of such a silica. Nor do the references inherently disclose these limitations, and even if they did, such an inherent disclosure is irrelevant, as inherency applies only to rejections for anticipation under 35 USC § 102, not for obviousness under 35 USC § 103. See, e.g. *In re Spormann*, 363 F.2d 444 (CCPA 1966); *In re Naylor*, 369 F.2d 765 (CCPA 1966); and *In re Sherry*, 566 F.2d 81 (CCPA 1977). Rather, there must be an actual disclosure, teaching, or suggestion. That is not the case here. Moreover, even if inherency did apply, the inherency must be certain, and must be the necessary and only result, not merely a possible result or even a probable result. *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999). There is no such inherency here. The examples of Endo bear this out. First they are directed to colloidal silica, and not fumed silica, and even were this distinction ignored, contrary to the teachings of Endo, no example of Endo falls within appellants' claimed range of SiOH content. The lowest number of silanol groups in the inventive Examples of Endo is in Example 3, where 65% of the 8.0 13 SiOH/nm² were reached, leaving 2.45 SiOH/nm². This is well above applicants claimed range. In Comparative Example 3, Endo reacts 85% of surface hydroxyl groups of a colloidal silica having a surface silanol content of 7 SiOH/nm² and otherwise having all the characteristics he discloses as useful,

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but this high amount of coupling agent derivatization, leaving only 1.2 SiOH/nm^2 , is stated to be suitable for use in his invention.

The Examiner respectfully disagrees with this argument. Endo teaches treating (any) starting silica having $1\text{-}30 \text{ SiOH/nm}^2$ with a silane such as claimed vinyltriethoxysilane I (See also spec. page 7, line 3) with a degree of coverage of the silanol groups 30-70% that overlaps claimed range of 1-50% resulting in blocked silica having $1 \times (0.3\text{-}0.7) - 30 \times (0.3\text{-}0.7) \text{ SiOH/nm}^2$, i.e. $0.3\text{-}21 \text{ SiOH/nm}^2$ that overlaps claimed range of $0.9\text{-}1.7 \text{ SiOH/nm}^2$. It is well settled that overlapping ranges are prima facie evidence of obviousness. Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Endo's ranges that corresponds to the claimed ranges. Thus, silica of Endo would include silica having a carbon content within claimed $0\% - 2.0\%$ by weight since silica would be covered with claimed silane at a claimed degree of coverage and resulting in silica particles having a density of surface silanol groups within claimed range of 0.9 and 1.7 SiOH/nm^2 . Since the degree of hydrophilicity/hydrophobicity of the surface, i.e. contact angle θ in air for water and methanol number, is determined by the number of free SiOH groups on the surface, silica of Endo would include silica meeting claimed methanol number of less than 30 or less than 20 and claimed contact angle θ in air for water of less than 180° , as having surface silanol groups within claimed amount of 0.9 and 1.7 SiOH/nm^2 . Note that according to the Appellants' specification it is irrelevant whether starting silica is fumed silica or wet process silica (See Spec., page 3, lines 4-9).

As Appellants' arguments that Examples of Endo do not show claimed SiOH/nm^2 , it is held that patents are relevant as prior art for all they contain. Disclosed

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examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. See MPEP 2123.

Appellants argue that claims 16, 18, 19, and 33 are separately patentable because Endo does not teach or suggest silylating with the use of an organosiloxane compound (II) of claim 16 or with both a silane and an organosiloxane of claim 18 or with a silane of claim 19 in which R1 is methyl, ethyl, propyl, butyl, pentyl, hexyl, octyl, decyl, dodecyl, hexadecyl, octadecyl, phenyl, biphenyl, naphthyl, benzyl, ethylpenyl, tolyl, or xylyl and which does not have a functional organic group that can be coupled to the polyester. The same is true of claim 33, wherein specific silylating agents are used. Even if the use of the specific type of colloidal silica required by Endo were disregarded, Endo still requires an organic functional group with which to couple the silica to the polyester. One skilled in the art would not be motivated to silylate silica with a non-functional silane for use in the compositions of Endo.

The Examiner respectfully disagrees with this argument because Endo teaches vinyltriethoxysilane, i.e. silane I) as claimed in Claims 15 and 17. Claims 16, 18, 19, and 33 are not separately patentable because they are directed to silane I) having various optional radicals, or to organosiloxane II) or to a mixture of I) and II) which are **optional** in claim 15 on which they depend directly or indirectly. Note that a non-functional silane is optional in claim 15 such that it is irrelevant whether one skilled in the art would be motivated or not to silylate silica with a non-functional silane for use in the compositions of Endo.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Elena Tsoy Lightfoot /

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